

ABSTRACT

A new gate-controlled, negative resistance diode device is achieved. The device comprises, first, a semiconductor layer in a substrate. The semiconductor layer contains an emitter region and a barrier region. The barrier region is in contact with the emitter region and is laterally adjacent to the emitter region. The semiconductor layer contains a collector region. A drift region comprises the semiconductor layer between the barrier region and the collector region. Finally, a gate comprises a conductor layer overlying the drift region, the barrier region, and at least a part of the emitter region with an insulating layer therebetween. A method of manufacture is achieved.